

development; and wildlife habitat.

The Basin Plan on page II-1.00 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...*" and with respect to disposal of wastewaters states that "*...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*"

The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.*" Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after November 28, 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

This Order contains Effluent Limitations requiring a tertiary level of treatment, or equivalent, which is necessary to protect the beneficial uses of the receiving water. The Regional Water Board has considered the factors listed in CWC section 13241 in establishing these requirements, as discussed in more detail in the Fact Sheet, Attachment F, Section IV.

2. **Antidegradation Policy.** 40 CFR 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

The Discharger submitted an Antidegradation Analysis Report in accordance with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16 stating that in order to maintain beneficial uses of the receiving water and to limit degradation of the receiving water, the Discharger operates a wastewater treatment process that meets or exceeds the highest statutory and regulatory requirements which meets or exceeds Best Practical Treatment or Control (BPTC).

The Regional Water Board finds that the Discharger implements water conservation measures, utilizes tertiary treatment technology, and is seeking to improve the communities potable water supply as the means of minimizing degradation and discharges in accordance with federal and State antidegradation policies. Therefore, the Regional Water Board finds that the Discharger is implementing all reasonable alternatives to discharge, and the permitted discharge allows important economic and social development to occur. Therefore, as discussed in more detail later in this Fact Sheet, this Order is in accordance with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

3. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. Compliance with the Anti-Backsliding requirements is discussed in Section IV.D.3.
4. **Emergency Planning and Community Right to Know Act.** Section 13263.6(a), California Water Code, requires that "the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective".

The Regional Water Board has adopted a numeric receiving water objective for selenium, ammonia, and boron in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan). As detailed elsewhere in this Permit, available effluent quality data indicate that effluent concentrations of selenium, ammonia, and boron do have a reasonable potential to cause or contribute to an excursion above numeric water quality objectives for selenium, ammonia, and boron included within the Basin Plan.

5. **Stormwater Requirements.** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations.
6. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered

Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

D. Impaired Water Bodies on CWA 303(d) List – Not Applicable

E. Other Plans, Policies and Regulations

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that *“are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.”* Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that *“[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”*

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy (“Policy for Application of Water Quality Objectives” that specifies that the Regional Water Board *“will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.”* This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent

limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's "Policy for Application of Water Quality Objectives") (40 CFR 122.44(d)(1)(vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. *As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board's prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.*

B. Technology-Based Effluent Limitations

1. Scope and Authority

Regulations promulgated in section 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

- a. **BOD₅ and TSS.** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD₅ and TSS. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for BOD₅ and TSS are based on the technical capability of the tertiary process. BOD₅ is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary and tertiary treatment standards for BOD₅ and TSS are indicators of the effectiveness of the treatment processes. The principal design parameter for wastewater treatment plants is the daily BOD₅ and TSS loading rates and the corresponding removal rate of the system. In applying 40 CFR Part 133 for weekly and monthly average BOD₅ and TSS limitations, the application of tertiary treatment processes results in the ability to achieve lower levels for BOD₅ and TSS than the secondary standards currently prescribed; the 30-day average BOD₅ and TSS limitations have been revised to 10 mg/L, which is technically based on the capability of a tertiary system. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD₅ and TSS is included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. See Table F-3 for final technology-based effluent limitations required by this Order. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD₅ and TSS must be achieved by a secondary treatment plant, it must also be achieved by a tertiary (i.e., treatment beyond secondary level) treatment plant. This Order contains a limitation requiring an average of 85 percent removal of BOD₅ and TSS over each calendar month.

Final discharge limitations in this Order are based on the technical capability of tertiary wastewater treatment systems. Technology based limitations are utilized to assure the treatment systems are properly designed and operated. Discharge Limitations have been established for tertiary treatment or equivalent as 10 mg/L (30-day average), 15 mg/L (weekly average) and 20 mg/L (daily maximum) for both BOD and TSS.

- b. **Flow.** The City of Woodland Water Pollution Control Facility is designed to provide a tertiary level of treatment at a design dry weather flow of up to 10.4 mgd. Therefore, this Order contains an Average Daily Discharge Flow effluent limit of 10.4 mgd.

- c. **pH.** Federal regulations, 40 CFR Part 133, also establish technology-based effluent limitations for pH. The secondary treatment standards require the pH of the effluent to be no lower than 6.0 and no greater than 9.0 standard units.

Table F-3. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD @ 20 °C	mg/L	10	15	20	--	--
Total Suspended Solids	mg/L	10	15	20	--	--
BOD and TSS Removal	%	85	--	--	--	--
pH	standard units	--	--	--	6.0	9.0

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an in-stream excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

- a. **Receiving Water.** Tule Canal is a part of Yolo Bypass within Sacramento Delta Hydrologic Unit. Refer to Section III for beneficial uses.
- b. **Hardness.** While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The *California Toxics Rule*, at (c)(4), states the following:

"Application of metals criteria. (i) For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/L or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations."

The State Water Board, in footnote 19 to Water Quality Order No. 2004-0013, stated: *"We note that...the Regional Water Board...applied a variable hardness value whereby effluent limitations will vary depending on the actual, current hardness values in the receiving water. We recommend that the Regional Water Board establish either fixed or seasonal effluent limitations for metals, as*

provided in the SIP, rather than 'floating' effluent limitations."

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. For purposes of establishing water quality-based effluent limitations, water quality criteria for acute and chronic copper, acute and chronic chromium III, acute and chronic nickel, acute and chronic zinc, and chronic cadmium were developed using the lowest effluent hardness value 330 mg/L; water quality criteria for acute cadmium, acute and chronic lead, and acute silver were developed using the lowest receiving water hardness value 130 mg/L.

- c. **Assimilative Capacity/Mixing Zone.** Tule Canal is ephemeral. The State Water Resources Control Board, in precedential decision, Order WQO 2002-0015, states that the use of the harmonic mean to determine flow rates is inappropriate for ephemeral streams where there is no consistent background dilution. The impact of considering a receiving stream to be ephemeral is that all limitations are "end of pipe" without any benefit of dilution. Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses.

3. Determining the Need for WQBELs

- a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: *"All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* (Basin Plan at III-8.00.) With regards to the narrative chemical constituents objective, the Basin Plan states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, *"...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)"* in Title 22 of CCR. The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."*

- b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for ammonia and selenium. Water quality-based effluent limitations (WQBELs) for these constituents are included in this Order.
- c. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.¹ The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.*" Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.
- d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.
- e. **Ammonia.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration) standards based on pH and chronic (30-day average, criteria continuous concentration) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing

¹ See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

temperature. USEPA's recommended criteria are show below:

$$CCC_{30\text{-day}} = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times \text{MIN}(2.85, 1.45 \cdot 10^{0.028(25 - T)}), \text{ and}$$
$$CMC = \left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right),$$

where T is in degrees Celsius

The previous Order contained "floating" effluent limitations for ammonia. In the absence of the option of including condition-dependant, "floating" effluent limitations, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses.

The maximum permitted effluent pH is 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L.

Because Tule Canal is dominated by the effluent, the maximum observed rolling 30-day average temperature and the maximum observed pH of the effluent during the period when the maximum observed rolling 30-day average temperature occurred were used to calculate the 30-day CCC. The maximum observed effluent 30-day rolling average temperature was 25.8°C. The maximum observed effluent pH value during the period when the maximum observed rolling 30-day average temperature was 8.2.

Using a pH value of 8.2 and the highest temperature value of 25.8°C on a rolling 30-day basis, the resulting 30-day CCC is 0.87 mg/L (as N). The 4-day average concentration is derived in accordance with the USEPA criterion as 2.5 times the 30-day CCC. Based on a 30-day CCC of 0.87 mg/L (as N), the 4-day average concentration that should not be exceeded is 2.18 mg/L (as N).

The MEC for ammonia was 1.3 mg/L, based on 235 samples collected between June 2006 and December 2007. Therefore, ammonia in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective.

The SIP procedure assumes a 4-day averaging period for calculating the long term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day chronic criteria. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day chronic criteria was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day, and 30-day

chronic criteria is then selected for deriving the AMEL and the MDEL. The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures.

This Order contains a final AMEL and MDEL for ammonia of 0.8 mg/L and 2.2 mg/L, respectively, based on USEPA's National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life and to assure the treatment process adequately nitrifies the waste stream to protect the aquatic habitat beneficial uses (see Attachment F, Table F-8 for WQBEL calculations).

Based on the sample results in the effluent, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after September 25, 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for ammonia are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the ammonia effluent limitations is established in the Order.

An interim performance-based maximum daily effluent limitation of 3.7 mg/L has been established in this Order. The interim limitation was determined as described in Attachment F, Section IV.E.3., and is in effect through 17 May 2010. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final ammonia effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study and prepare and implement a pollution prevention plan that is in compliance with CWC section 13263.3(d)(3).

- f. **Chlorine Residual.** The previous permit contained effluent limitations for chlorine. However, the Discharger has since upgraded the Facility, and now uses UV Disinfection instead of disinfection by chlorination. Therefore, this Order does not contain chlorine effluent limitations. However, this Order requires the Discharger to monitor for total chlorine residual should chlorine be used at the Facility (e.g., Maintenance activities). This removal of the chlorine residual effluent limitation is consistent with the anti-backsliding requirements of the CWA and Federal regulations.
- g. **Electrical Conductivity. (see Subsection k. Salinity)**
- h. **Mercury.** The current USEPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criteria). The CTR contains a human health criterion (based on a one-in-a-million cancer risk) of 0.050 µg/L for waters from which both water and aquatic organisms are consumed. Both values are controversial and

subject to change. In 40 CFR Part 131, USEPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species and that "...more stringent mercury limits may be determined and implemented through use of the State's narrative criterion." In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date. The maximum observed effluent mercury concentration was 0.014 µg/L, based on 41 samples collected between June 2006 and December 2007. Wastewater from the treatment plant is discharged to Tule Canal, within the Yolo Bypass, which then flows to the Sacramento-San Joaquin Delta. Mercury bioaccumulates in fish tissue and, therefore, discharge of mercury to the receiving water is likely to contribute to exceedances of the narrative toxicity objective and impacts on beneficial uses. Because the Sacramento-San Joaquin Delta has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels. The SIP, Section 1.3, requires the establishment of an effluent limitation for a constituent when the receiving stream background water quality exceeds an applicable criterion or objective. This Order carries forward Effluent Limitations for mercury as a monthly mass limitation of 0.088 lbs/month. The limitation was derived from the existing mass limitation of 1.06 lbs as a 12 month average divided by twelve months per year. Monitoring results indicate the Discharger can comply with the monthly mass limitation. This limitation will exist until a total maximum daily load (TMDL) can be established and USEPA develops mercury standards that are protective of human health. If USEPA develops new water quality standards for mercury, this permit may be reopened and the Effluent Limitations adjusted.

- i. **Pathogens.** The beneficial uses of the Tule Canal include municipal and domestic supply, water contact recreation and agricultural irrigation supply, and there is, at times, less than 20:1 dilution. To protect these beneficial uses, the Regional Water Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

The California Department of Public Health (DPH) has developed reclamation criteria, CCR, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 ml as a 7-day median. As coliform organisms are living and mobile, it is impracticable to quantify an exact number of coliform organisms and to establish weekly average limitations. Instead, coliform organisms are measured as a most probable number and regulated

based on a 7-day median limitation.

Title 22 also requires that recycled water used as a source of water supply for non-restricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A non-restricted recreational impoundment is defined as "...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities." Title 22 is not directly applicable to surface waters; however, the Regional Water Board finds that it is appropriate to apply an equivalent level of treatment to that required by DPH's reclamation criteria because the receiving water is used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations. Therefore, to ensure compliance with the DHS recommended Title 22 disinfection criteria, weekly average effluent limitations are impracticable for turbidity.

- j. **pH.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "...pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses." Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.
- k. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. There are no USEPA water quality criteria for the protection of aquatic organisms for these constituents. The Basin Plan contains a chemical constituent objective that incorporates State MCLs, contains a narrative objective, and contains numeric water quality objectives for EC, TDS, Sulfate, and Chloride.

Table F-4. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal ¹	Secondary MCL ³	Effluent	
			Avg	Max
EC (µmhos/cm)	700 ²	900, 1600, 2200	1562	1844
TDS (mg/L)	450 ²	500, 1000, 1500	1042	1256
Boron (µg/L)	700	N/A	2540	3400
Sulfate (mg/L)	N/A	250, 500, 600	N/A	N/A
Chloride (mg/L)	106 ²	250, 500, 600	N/A	N/A

- 1 Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985)
- 2 Agricultural water quality goals listed provide no restrictions on crop type or irrigation methods for maximum crop yield. Higher concentrations may require special irrigation methods to maintain crop yields or may restrict types of crops grown.
- 3 The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

- i. **Boron.** The Agricultural Water Quality Goal for boron is 700 µg/L. Boron in excessive concentration can cause damage to plant life.

The MEC for boron was 3000 µg/L, based on 15 samples collected between June 2006 and December 2007. No dilution is allowed due to periods of no flow in the receiving water. Agricultural irrigation is designated as a beneficial use of the receiving stream. Undiluted wastewater effluent can be withdrawn from Tule Canal for agricultural irrigation.

- ii. **Chloride.** The secondary MCL for chloride is 250 mg/L, as recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride, that would apply the narrative chemical constituent objective, is 106 mg/L as a long-term average based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.
- iii. **Electrical Conductivity (EC).** The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The agricultural water quality goal, that would apply the narrative chemical constituents objective, is 700 µmhos/cm as a long-term average based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 700 µmhos/cm agricultural water quality goal is intended

to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops, such as beans, carrots, turnips, and strawberries. These crops are either currently grown in the area or may be grown in the future. Most other crops can tolerate higher EC concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the EC, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

A review of the Discharger's monitoring reports from June 2006 through December 2007 shows an average effluent EC of 1562 $\mu\text{mhos/cm}$, with a range from 936 $\mu\text{mhos/cm}$ to 1844 $\mu\text{mhos/cm}$ for 507 samples. The EC levels in the discharge exceed the agricultural water quality goal of 700 $\mu\text{mhos/cm}$. The background receiving water EC averaged 613 $\mu\text{mhos/cm}$ in 156 sampling events collected by the Discharger from March 2003 through December 2007.

- iv. **Sulfate.** The secondary MCL for sulfate is 250 mg/L as recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum.
- v. **Total Dissolved Solids (TDS).** The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The recommended agricultural water quality goal for TDS, that would apply the narrative chemical constituent objective, is 450 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

The average TDS effluent concentration was 1042 mg/L and a ranged from 882 mg/L to 1256 mg/L for 338 samples collected by the Discharger from June 2006 through December 2007. These concentrations exceed the agricultural water quality goal.

Salinity Effluent Limitations. To protect the beneficial uses of the receiving water, this Order contains performance-based effluent limitations for boron and EC. In addition, the Discharger is required to submit periodic updates to the Regional Water Board on the City of Woodland's progress in improving their potable water supply. Improving the potable water supply should result in decreases in EC and boron concentrations in the Discharger's effluent.

- I. **Selenium.** The Agricultural Water Quality Goal for selenium is 20 µg/L. U.S. EPA established CTR criteria for the protection of freshwater aquatic life for selenium. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for selenium are 5.0 µg/L and 20 µg/L, respectively.

The MEC for selenium was 32 µg/L, based on 14 samples collected between June 2006 and December 2007. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for selenium. No dilution is allowed due to periods of no flow in the receiving water. An AMEL and MDEL for selenium of 3.2 µg/L and 9.2 µg/L, respectively, are included in this Order based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Table F-11 for WQBEL calculations).

As report by the Discharger, the selenium in the Discharger's influent is primarily from the City's potable water (groundwater). The Discharger believes that the most cost effective method for lowering the effluent selenium, as well as other dissolved pollutants in the groundwater, is to obtain new municipal water supplies. Development of a new surface water supply is a longer-term plan that is expected to be completed sometime between 2016 and 2020.

The Discharger is unable to comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.D.1., an interim performance-based maximum daily limitation of 31 µg/L was calculated.

Section 2.1 of the SIP provides that: *"Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit."* Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: *..."(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable."* The new water quality-based effluent limitations for selenium become effective on **May 18, 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final selenium effluent limitations. The interim effluent limitations are in effect through **May 17, 2010**. As part of the compliance schedule for selenium, the Discharger shall develop a

pollution prevention program in compliance with CWC section 13263.3(d)(3) and submit an engineering treatment feasibility study.

The Discharger has indicated in the 13 August 2008 Infeasibility Report that additional time may be required beyond 18 May 2010 to comply with final effluent limits for selenium. Based on the Discharger's schedule to obtain new municipal water supplies, the Regional Water Board may consider at a future date issuance of a Time Schedule Order to provide additional time to comply with final effluent limits for selenium.

m. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

4. WQBEL Calculations

- a. Effluent limitations for ammonia, copper, cyanide, and selenium were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations.
- b. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC$$

$$ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

ECA_{acute} = effluent concentration allowance for acute (one-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (four-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (one-hour average)

CCC = criteria continuous concentration (four-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$\begin{aligned}
 & \text{AMEL} = \text{mult}_{\text{AMEL}} \left[\min \left(\overbrace{M_A ECA_{\text{acute}}}^{\text{LTA}_{\text{acute}}}, M_C ECA_{\text{chronic}} \right) \right] \\
 & \text{MDEL} = \text{mult}_{\text{MDEL}} \left[\min \left(M_A ECA_{\text{acute}}, \underbrace{M_C ECA_{\text{chronic}}}_{\text{LTA}_{\text{chronic}}} \right) \right] \\
 & \text{MDEL}_{\text{HH}} = \left(\frac{\text{mult}_{\text{MDEL}}}{\text{mult}_{\text{AMEL}}} \right) \text{AMEL}_{\text{HH}}
 \end{aligned}$$

where: $\text{mult}_{\text{AMEL}}$ = statistical multiplier converting minimum LTA to AMEL
 $\text{mult}_{\text{MDEL}}$ = statistical multiplier converting minimum LTA to MDEL
 M_A = statistical multiplier converting CMC to LTA
 M_C = statistical multiplier converting CCC to LTA

Water quality-based effluent limitations were calculated for ammonia and selenium as follows in Tables F-5 through F-6, below.

Table F-5. WQBEL Calculations for Ammonia

	Acute	Chronic
pH ⁽¹⁾	8.5	8.2
Temperature °C ⁽²⁾	N/A	25.8
Criteria (mg/L) ⁽³⁾	2.14	0.87
Dilution Credit	No Dilution	No Dilution
ECA	2.14	0.87
ECA Multiplier	0.19	0.64
LTA ⁽⁴⁾	0.41	0.56
AMEL Multiplier (95 th %)	2.03	⁽⁵⁾
AMEL (mg/L)	0.83	⁽⁵⁾
MDEL Multiplier (99 th %)	5.29	⁽⁵⁾
MDEL (mg/L)	2.17	⁽⁵⁾

⁽¹⁾ Acute design pH = 8.5 (max. allowed effluent pH), Chronic design pH = highest reported pH

⁽²⁾ Temperature = Maximum 30-day average seasonal effluent temperature

⁽³⁾ USEPA Ambient Water Quality Criteria

⁽⁴⁾ LTA developed based on Acute and Chronic ECA Multipliers calculated at 99th percentile level per sections 5.4.1 and 5.5.4 of TSD.

⁽⁵⁾ Limitations based on acute LTA ($\text{LTA}_{\text{acute}} < \text{LTA}_{\text{chronic}}$)

Table F-6. WQBEL Calculations for Selenium

	Acute	Chronic
Criteria, dissolved (µg/L)	20	5
Dilution Credit	No Dilution	No Dilution
ECA, total recoverable	20	5
ECA Multiplier	0.15	0.27
LTA	2.96	1.36
AMEL Multiplier (95 th)	(1)	2.36
AMEL (µg/L)	(1)	3.21
MDEL Multiplier (99 th)	(1)	6.76
MDEL (µg/L)	(1)	9.19

(1) Limitations based on chronic LTA (Chronic LTA < Acute LTA)

Table F-7. Summary of Water Quality-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
pH	standard units	--	--	--	6.5	8.5
Ammonia	mg/L	0.8	--	2.2	--	--
Selenium	ug/L	3.2	--	9.2	--	--

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

- a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00) The Basin Plan also states that, "...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...". USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity,

ambient waters shall not demonstrate a test result of greater than 1 TUc."
Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

Acute Toxicity. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassays -----	70%
Median for any three or more consecutive bioassays -----	90%

- b. **Chronic Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00) Adequate WET data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. Attachment E of this Order requires quarterly chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

A narrative effluent limit is included in this Order that requires that there shall be no chronic toxicity in the effluent discharge.

To ensure compliance with the Basin Plan's narrative toxicity objective and the narrative toxicity limitation contained in this Order, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). In addition to WET monitoring, Special Provisions VI.C.2.a. requires the Discharger to submit to the Regional Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity is demonstrated. The numeric toxicity monitoring trigger is not an effluent limitation, it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as the threshold to initiate a TRE if a pattern of effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations.

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In

addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g. CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated based upon the permitted average daily discharge flow allowed in Section IV.A.1 of the Limitations and Discharge Requirements.

2. Averaging Periods for Effluent Limitations.

Title 40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, the US EPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. *"First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed."* (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for ammonia, as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for BOD, TSS, pH, coliform, and turbidity, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

3. Satisfaction of Anti-Backsliding Requirements.

Some effluent limitations in this Order are less stringent than those in the previous Order. As discussed below this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

Order No. R5-2003-0031-R01 requires effluent limitations of total chlorine residual, dibromochloromethane, oil and grease, settleable solids, aluminum, iron, and fluoride. The Discharger has completed upgrades to the facility including the addition of an ultraviolet light disinfection system as well as tertiary filtration. Effluent limitations of total chlorine residual and dibromochloromethane are eliminated due to the replacement of chlorination disinfection system with an ultraviolet (UV) light disinfection system. Effluent limitations of aluminum, iron, and fluoride are eliminated due to new monitoring information becoming available resulting in no reasonable potential for these parameters to cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Effluent limitations for oil and grease and settleable solids are being removed based on improved pretreatment and treatment systems being

employed at the Facility. In the past, oil and grease issues were common at POTWs and an effluent limitation was necessary to protect receiving waters. The implementation of fats, oil, and grease (FOG) pretreatment programs, along with the upgrades of the treatment system to a tertiary level of performance, have resulted in the reduction of oil and grease in the Facility's effluent to non-detect levels. In addition, the Discharger has not had detectable levels of settleable solids in their effluent over the past five years. Elimination of effluent limitations of these constituents is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Any impact on existing water quality will be insignificant.

The previous permit contained effluent limitations for turbidity. The prior limitations were solely an operational check to ensure the treatment system was functioning properly and could meet the limits for solids and coliform. The prior effluent limitations were not intended to regulate turbidity in the receiving water. Rather, turbidity is an operational parameter to determine proper system functioning and not a water quality based limitation.

The revised Order contains performance based operational turbidity specifications to be met prior to disinfection in lieu of effluent limitations. The revised Order does not include effluent limitations for turbidity. However, the performance-based specification in this Order is an equivalent limit that is not less stringent, and therefore does not constitute backsliding.

The proposed revised operational specifications for turbidity are the same as the effluent limitations in the previous permit, with the inclusion of a more stringent requirement for an instantaneous maximum limit at any time. (See Special Provisions 4.A. Ultraviolet Disinfection (UV) System Operating Specifications for turbidity specifications.) The proposed revised permit moves the point of compliance from the final effluent after disinfection to an internal compliance point prior to disinfection. These revisions are consistent with state regulations implementing recycled water requirements.

The revision in the turbidity limitation is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16 because this Order imposes equivalent or more stringent requirements than the prior permit and therefore does not allow degradation.

The previous Order required chlorine residual weekly and daily averages effluent limitations at 0.01 and 0.02 respectively. This Order removes these chlorine residual limitations, because the Discharger discontinued the use of chlorine for disinfection, and now uses ultraviolet (UV) disinfection.

4. Satisfaction of Antidegradation Policy

- a. **Surface Water.** The Discharger included an antidegradation analysis in conjunction with their Report of Waste Discharge that provides a complete antidegradation analysis following the guidance provided by State Water Board

APU 90-004. The Report of Waste Discharge was prepared by ECO:LOGIC Engineering. Pursuant to the guidelines, the antidegradation analysis evaluated whether changes in water quality resulting from the proposed increase from 7.8 mgd to 10.4 mgd in discharge flow to Tule Canal are consistent with the maximum benefit to the people of the state, will not unreasonably affect beneficial uses, will not cause water quality to be less than water quality objectives, and that the discharge will provide protection for existing in-stream uses and water quality necessary to protect those uses. The Regional Water Board concurs with the Antidegradation Analysis.

i. **Water Quality Parameters and Beneficial Uses that will be Affected by This Order and the Extent of the Impact.** The discharge authorized by this Order does not adversely impact beneficial uses of the receiving water or downstream receiving waters. All beneficial uses will be maintained and protected. This Order provides for an increase in the volume and mass of pollutants discharged directly to the receiving water. 40 CFR 131.12 defines the following tier designations to describe water quality in the receiving water body:

- Tier 1 Designation: *Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. (40 CFR 131.12)*
- Tier 2 Designation: *Where the quality of waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control. (40 CFR 131.12)*

The tier designation is assigned on a pollutant-by-pollutant basis. The following is the potential effect on water quality parameters regulated in this Order, as was assessed in the antidegradation analysis:

- The projected increase in permitted discharge capacity causes slight increases in downstream water quality concentrations in Tule Canal for some constituents, primarily due to the quality of the City's potable water supply. The projected increases will not adversely affect existing or probable beneficial uses of Tule Canal, nor will it cause water quality to fall below applicable water quality objectives.

- The City of Woodland is in the process of improving their potable water supply. This will improve the quality of influent to the Discharger and lower effluent concentrations of EC, boron, and selenium.

ii. **Scientific Rationale for Determining Potential Impacts to Water Quality.**

The rationale used in the antidegradation analysis is based on 40 CFR 131.12, State Water Board Resolution No. 68-16, and an Administrative Procedures Update (APU 90-004) issued by the State Water Board to the Regional Water Boards.

The scientific rationale used in the Antidegradation Analysis to determine if the Order allows a lowering of water quality is to compare the projected receiving water quality to the water quality objectives and/or criteria used to protect designated beneficial uses. This approach addresses a key objective of the antidegradation analysis to "[c]ompare receiving water quality to the water quality objectives established to protect designated beneficial uses" (APU 90-004). APU 90-004 also requires the consideration of "feasible alternative control measures" as part of the procedures for a complete antidegradation analysis.

The antidegradation analysis provided an assessment of expected water quality impacts on Tule Canal if the discharge volume is increased to 10.4 mgd. Pollutants that significantly increased concentration or mass downstream would have required an alternatives analysis to determine whether implementation of alternatives to the proposed action would be in the best socioeconomic interest of the people of the region, and be to the maximum benefit of the people of the State. Details on the scientific rationale are discussed in detail in the antidegradation analysis. This includes a detailed discussion of the analytical equations, historical data, and long-term water quality effects associated with a continuous discharge to Tule Canal.

The Regional Water Board concurs with this scientific approach.

- iii. **Alternative Control Measures.** The Discharger considered several alternatives that would reduce or eliminate the lowering of water quality resulting from the proposed 10.4 mgd discharge. Effluent disposal alternatives were assessed to determine if any alternative would substantially reduce or eliminate the lowering of water quality as a result of the proposed discharge. Alternatives included 1) not increasing Facility capacity, 2) improving potable water supplies, and 3) additional advanced wastewater treatment and additional re-aeration facilities. Each of these alternatives possess unique abilities to address water quality constituents of concern, and each has distinct implementation benefits, liabilities, and costs.
- iv. **Socioeconomic Evaluation.** The objective of the socioeconomic analysis was to determine if the lowering of Tule Canal water quality is in the maximum interest of the people of the state. Given the current infrastructure, future development in the City of Woodland would rely on the Discharger for

wastewater collection and treatment. The plant expansion and new 10.4 mgd surface water discharge would accommodate planned and approved growth in the City of Woodland and surrounding areas. From a socioeconomic impact perspective, construction and operation of additional advanced treatment would lead to a projected \$39 to \$52 dollars per month in user fees (based in 2004 dollars), while adding reaeration facilities would add an additional \$2 to \$5 per month to the monthly rate. Improving the potable water supply is estimated to increase water bills by approximately \$20 per month. The City is in the process of improving the potable water supply. Requiring additional treatment will lead to decreases in "after tax" or disposable personal income (DPI) spending of ratepayers. Reductions in DPI in the City's local economy due to the financing of additional treatment, in addition to the significant 2006 upgrades to the treatment plant, would result in fewer dollars being spent on non-essential goods and services by ratepayers. Decreased spending within an economy ultimately leads to decreases in labor demand, which further impacts household spending due to losses in employment. Increased connection fees for business, commercial, and industrial ratepayers makes Woodland a less attractive place to establish or expand such businesses, when all other considerations remain unchanged. On balance, allowing the minor degradation of water quality is in the best interest of the people of the area and the state, compared to other options, and is necessary to accommodate important economic or social development in the area.

v. **Justification for Allowing Degradation.** Potential degradation identified in the antidegradation analysis due to this Order is justified by the following considerations:

- Implementation of alternatives does not provide important socioeconomic benefit to the people of the region, nor do they provide maximum benefit to the people of the State. The socioeconomic evaluation of alternatives to the proposed project would inhibit socioeconomic growth making it economically infeasible for any new development to occur.
- The Discharger's planned expansion will continue to produce Title 22 tertiary treated effluent that will result in minimal water quality degradation. The Discharger's planned wastewater treatment process will meet or exceed the highest statutory and regulatory requirements which meets or exceeds best practical treatment and control (BPTC);
- This Order is fully protective of beneficial use of Tule Canal. The anticipated water quality changes in Tule Canal will not reduce or impair its designated beneficial uses and is consistent with State and federal antidegradation policies;
- No feasible alternatives currently exist to reduce the impacts; and

- The Discharger has fully satisfied the requirements of the intergovernmental coordination and public participation provisions of the State's continuing planning process concurrent with the public participation period of this Order.

Table F-8. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20 ° C	mg/L	10	15	20	--	--
	Lbs/day ¹	867	1301	1735	--	--
Total Suspended Solids (TSS)	mg/L	10	15	20	--	--
	Lbs/day ¹	867	1301	1735	--	--
pH	standard units	--	--	--	6.5	8.5
Ammonia	mg/L	0.8	--	2.2	--	--
Selenium	µg/L	3.2	--	9.2	--	--

1. Based upon a design treatment capacity of 10.4 mgd.

- Percent Removal:** The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.
- Mercury.** The total monthly mass discharge of total mercury shall not exceed 0.088 lbs/month.
- Acute Whole Effluent Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:
 - 70%, minimum for any one bioassay; and
 - 90%, median for any three consecutive bioassays.
- Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:
 - 2.2 most probable number (MPN) per 100 mL, as a 7-day median; and
 - 23 MPN/100 mL, more than once in any 30-day period; and
 - 240 MPN/100 mL, at any time.
- Average Daily Discharge Flow.** The Average Daily Discharge Flow shall not exceed 10.4 mgd.

E. Interim Effluent Limitations

- Ammonia and Selenium.** The SIP, section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Water Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must be based on current treatment plant performance or existing permit limitations, whichever is more stringent. The State Water Board has held that the SIP may be used as guidance for non-CTR constituents. Therefore,

the SIP requirement for interim effluent limitations has been applied to both CTR and non-CTR constituents in this Order.

The interim limitations for ammonia and selenium in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data.

When there are less than ten sampling data points available, the *Technical Support Document for Water Quality- Based Toxics Control* ((EPA/505/2-90-001), TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed effluent concentration to obtain the daily maximum interim limitation (TSD, Table 5-2).

The Regional Water Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with effluent limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final effluent limitations, but in compliance with the interim effluent limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the effluent limitation can be achieved.

Table 7 summarizes the calculations of the interim effluent limitations for ammonia and selenium:

Table F-9. Interim Effluent Limitation Calculation Summary

Parameter	MEC	Mean	Std. Dev.	# of Samples	Interim Limitation
Ammonia	13000	184	1057	235	3700
Selenium	32	6.1	7.6	14	31

Note: All values are in µg/L.

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses." The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Surface Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and electrical conductivity.

Numeric Basin Plan objectives for bacteria, dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rational for these numeric receiving surface water limitations are as follows:

- a. **Bacteria.** The Basin Plan includes a water quality objective that "[I]n water designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml." Numeric Receiving Water Limitations for bacteria are included in this Order and are based on the Basin Plan objective.
- b. **Biostimulatory Substances.** The Basin Plan includes a water quality objective that "[W]ater shall not contain biostimulatory substances which promote aquatic

- c. **Color.** The Basin Plan includes a water quality objective that “[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses.” Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.
- d. **Chemical Constituents.** The Basin Plan includes a water quality objective that “[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.
- e. **Dissolved Oxygen.** The Tule Canal has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of COLD does apply to the Tule Canal, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.
- For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that “...the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.” This objective was included as a receiving water limitation in this Order.
- f. **Floating Material.** The Basin Plan includes a water quality objective that “[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.
- g. **Oil and Grease.** The Basin Plan includes a water quality objective that “[W]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.” Receiving Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.
- h. **pH.** The Basin Plan includes water quality objective that “[T]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses” This Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates

that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

- i. **Pesticides.** The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.
- j. **Radioactivity.** The Basin Plan includes a water quality objective that “[R]adionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.” The Basin Plan states further that “[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations...” Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.
- k. **Sediment.** The Basin Plan includes a water quality objective that “[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses” Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.
- l. **Settleable Material.** The Basin Plan includes a water quality objective that “[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.” Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.
- m. **Suspended Material.** The Basin Plan includes a water quality objective that “[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.
- n. **Taste and Odors.** The Basin Plan includes a water quality objective that “[W]ater shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.” Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

- o. **Temperature.** The Tule Canal has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that “[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.” This Order includes a receiving water limitation based on this objective.
- p. **Toxicity.** The Basin Plan includes a water quality objective that “[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.
- q. **Turbidity.** The Basin Plan includes a water quality objective that “[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:
- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
 - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
 - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
 - Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

B. Groundwater

1. The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.
2. Basin Plan water quality objectives include narrative objectives for chemical constituents, tastes and odors, and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for chemical constituents and radioactivity in groundwaters designated as municipal supply. These include, at a minimum, compliance with MCLs in Title 22 of the CCR. The bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 ml. The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do

not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use.

3. Groundwater limitations are required to protect the beneficial uses of the underlying groundwater.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

1. Influent monitoring is required to collect data on the characteristics of the wastewater and to assess compliance with effluent limitations (e.g., BOD and TSS reduction requirements).

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream and groundwater.
2. The SIP states that if "...all reported detection limits of the pollutant in the effluent are greater than or equal to the C [water quality criterion or objective] value, the RWQCB [Regional Water Board] shall establish interim requirements...that require additional monitoring for the pollutant..." All reported detection limits for constituents are greater than or equal to corresponding applicable water quality criteria or objectives. Monitoring for these constituents has been included in this Order in accordance with the SIP.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Quarterly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.

2. **Chronic Toxicity.** Quarterly chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective.

D. Receiving Water Monitoring

1. Surface Water

- a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.

2. Groundwater

- a. Section 13267 of the California Water Code states, in part, *"(a) A Regional Water Board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region" and "(b) (1) In conducting an investigation..., the Regional Water Board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports."* The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program (Attachment E) is issued pursuant to California Water Code Section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the facility subject to this Order.
- b. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution No. 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment or control. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. If groundwater quality has been or may be degraded by the discharge, this Order may be reopened and specific numeric

limitations established consistent with Resolution 68-16 and the Basin Plan.

- c. This Order requires the Discharger to continue groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

E. Other Monitoring Requirements

1. Biosolids Monitoring

Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements (Special Provisions VI.C.6.a.). Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation.

2. Water Supply Monitoring

Water supply monitoring is required to evaluate the source of constituents in the wastewater.

3. Ultraviolet Disinfection System Monitoring

UV System specifications and monitoring and reporting is required to ensure that adequate UV dosage is applied to the wastewater to inactivate pathogens e.g. viruses in the wastewater. UV Disinfection system monitoring are imposed pursuant to requirements established by the California Department of Public Health, (DPH) and the National Water Research Institute (NWRI) and American Water Works Association Research Foundation NWRI/AWWARF's *"Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse."*

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either

expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

- a. **Pollution Prevention.** This Order requires the Discharger to prepare pollution prevention plans following CWC section 13263.3(d)(3) for ammonia, boron, copper, cyanide, mercury, and selenium. This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of effluent limitations and requirements for these constituents based on a review of the pollution prevention plans.
- b. **Whole Effluent Toxicity.** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity limitation based on that objective.

2. Special Studies and Additional Monitoring Requirements

- a. **Chronic Whole Effluent Toxicity Requirements.** Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00.) Adequate WET data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. Attachment E of this Order requires Quarterly chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

In addition to WET monitoring, this provision requires the Discharger to submit to the Regional Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity is demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 1 TUC (where TUC = $100/\text{NOEC}$) is applied in the provision, because this Order does not allow any dilution for the chronic condition. Therefore, a TRE is triggered when the effluent exhibits a pattern of toxicity at 100% effluent.

Accelerated Monitoring. The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is a pattern of toxicity before requiring the implementation of a TRE. Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests every two weeks using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991* (TSD). The TSD at page 118 states, "EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required." Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

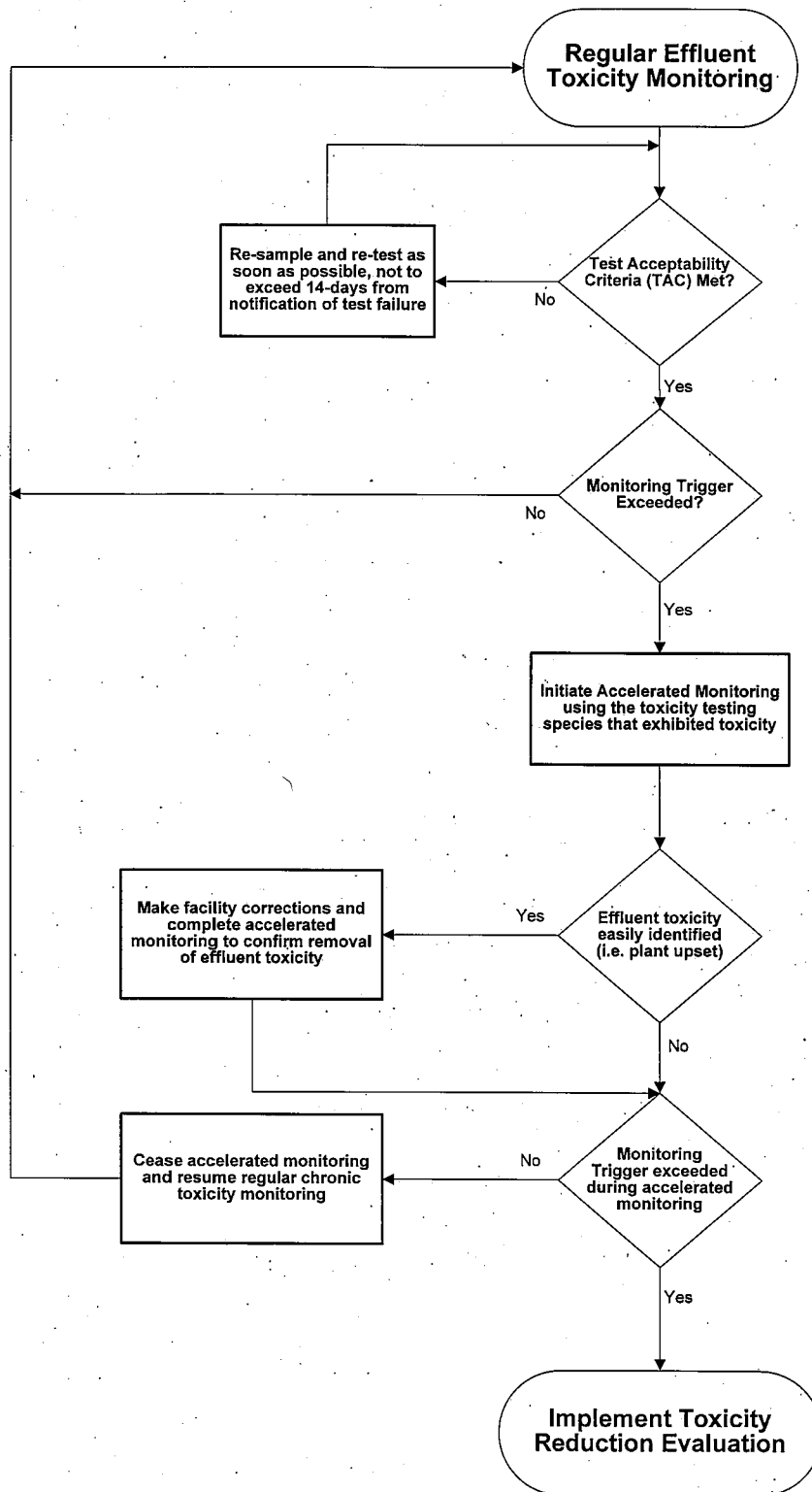
See the WET Accelerated Monitoring Flow Chart (Figure F-X), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

TRE Guidance. The Discharger is required to prepare a TRE Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*, (EPA/833B-99/002), August 1999.
- *Generalized Methodology for Conducting Industrial TREs*, (EPA/600/2-88/070), April 1989.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures*, Second Edition, EPA 600/6-91/005F, February 1991.

- *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA 600/6-91/005F, May 1992.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/080, September 1993.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/081, September 1993.
- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, October 2002.
- *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA-821-R-02-013, October 2002.
- *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991

Figure F-3
WET Accelerated Monitoring Flow Chart



- b. **Groundwater Monitoring (Special Provisions VI.C.2.d.).** To determine compliance with Groundwater Limitations V.B., the Discharger has recently expanded its groundwater monitoring network and has completed the technical report, entitled City of Woodland Hydrogeologic Evaluation Report, July 2008 by ECO:LOGIC Engineering. The analysis indicates that the WPCF pond system appears to increase the salinity in the downgradient monitoring wells above background water quality. The Discharger shall submit a technical report which assesses the WPCF and potable water system components with respect to BPTC and minimizes the WPCF's impact on groundwater quality.

3. Best Management Practices and Pollution Prevention

- a. **Salinity Evaluation and Minimization Plan.** In accordance with 40 CFR §122.44(k), the Discharger is required to implement best management practices to reduce the discharge of salinity to the Tule Canal. Particularly an Evaluation and Minimization Plan for salinity is required in this Order to ensure adequate measures are developed and implemented by the Discharger.
- b. **CWC section 13263.3(d)(3) Pollution Prevention Plans.** The pollution prevention plans required for ammonia and selenium shall, at minimum, meet the requirements outlined in CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plans include the following:
 - i. An estimate of all of the sources of pollutant contributing, or potentially contributing, to the loadings of a pollutant in the treatment plant influent.
 - ii. An analysis of the methods that could be used to prevent the discharge of the pollutants into the Facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the Facility. The analysis also shall identify sources, or potential sources, not within the ability or authority of the Discharger to control, such as pollutants in the potable water supply, airborne pollutants, pharmaceuticals, or pesticides, and estimate the magnitude of those sources, to the extent feasible.
 - iii. An estimate of load reductions that may be attained through the methods identified in subparagraph ii.
 - iv. A plan for monitoring the results of the pollution prevention program.
 - v. A description of the tasks, cost, and time required to investigate and implement various elements in the pollution prevention plan.
 - vi. A statement of the Discharger's pollution prevention goals and strategies, including priorities for short-term and long-term action, and a description of

the Discharger's intended pollution prevention activities for the immediate future.

- vii. A description of the Discharger's existing pollution prevention programs.
- viii. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.
- ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.

4. Construction, Operation, and Maintenance Specifications

a. Ultraviolet Disinfection (UV) System Operating Specifications

UV System specifications and monitoring and reporting is required when the system becomes operational to ensure that adequate UV dosage is applied to the wastewater to inactivate pathogens e.g. viruses in the wastewater. UV dosage is dependent on several factors such as UV transmittance, UV power setting, wastewater turbidity, and wastewater flow through the UV System. Monitoring and reporting of these parameters is necessary to determine compliance with minimum dosage requirements established by the California Department of Public Health, (DPH) and the National Water Research Institute (NWRI) and American Water Works Association Research Foundation. NWRI/AWWARF's *"Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse"* first published in December 2000 revised as a Second Edition dated May 2003. In addition, a Memorandum dated 1 November 2004 issued by DPH to Regional Board executive officers recommended that provisions be included in permits to water recycling treatment plants employing UV disinfection requiring Dischargers to establish fixed cleaning frequency of quartz sleeves as well as include provisions that specify minimum delivered UV dose that must be maintained (as recommended by the NWRI/AWWARF UV Disinfection Guidelines).

Turbidity is included as an operational specification as an indicator of the effectiveness of the treatment process and to assure compliance with effluent coliform limitations. The tertiary treatment process, is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the treatment system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity and could impact UV dosage. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. The operational specification requires that turbidity prior to disinfection shall not exceed 2 NTU as a daily average; 5 NTU, more than 5% of the time within a 24-hour period, and an instantaneous maximum of 10 NTU.

Minimum UV dosage and turbidity specifications are included as operating criteria in Special Provisions, Section V1.C.5 and Monitoring and Reporting requirements, Attachment E, Section IX.B., to ensure that adequate disinfection of wastewater is achieved.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. Pretreatment Requirements.

- i. The Federal Clean Water Act, Section 307(b), and Federal Regulations, 40 CFR Part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants, which will interfere with treatment plant operations or sludge disposal, and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations. Pretreatment requirements are imposed pursuant to 40 CFR Part 403.
- ii. The Discharger shall implement and enforce its approved pretreatment program and is an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Regional Water Board, the State Water Board or the U.S. EPA may take enforcement actions against the Discharger as authorized by the CWA.

6. Other Special Provisions

7. Compliance Schedules

The use and location of compliance schedules in the permit depends on the Discharger's ability to comply and the source of the applied water quality criteria.

- a. The Discharger submitted a request, and justification, within 90 days of the effective date of this Order, for a compliance schedule for ammonia. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for ammonia and requires full compliance by 18 May 2010.
- b. The Discharger submitted a request, and justification, within 90 days of the effective date of this Order, for a compliance schedule for selenium. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for selenium and requires full compliance by 18 May 2010.

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for City of Woodland Water Pollution Control Facility. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through by posting in public areas (the nearest courthouse or city hall, the post office nearest the Facility, and near the entrance of the Facility by 5 September 2008.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on 6 October 2008.

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: 5 February 2009
Time: 8:30 am
Location: Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is <http://www.waterboards.ca.gov/centralvalley/> where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling 916-464-3291.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Ken Landau at 916-464-4726.